R/V Shumpu Maru Cruise SU9404

1 Cruise Narrative

1.1 Highlights

Expedition Designation
Shumpu Maru Cruise SU9404

Chief Scientists
Leg 1:Noriya YOSHIOKA, Kobe Marine Observatory(KMO)

Ship
R/V Shumpu Maru

Ports of Call
Leg 1:Kobe to Kochi

Cruise Dates
Leg 1:April 28 to May 6,1994

1.2 Cruise Summary

The cruise track and station locations of leg 1 are shown in Figure 1.
The ship departed Kobe on April 28,1994, and made 6 CTD/rosette stations of a section PR17. 4 XBT stations were made between CTD/rosette stations. To first CTD/rosette station the ship reached at 1721 UTC on April 30, from last station departed at 2151 UTC on May 1.

The CTD is EG&G NBIS Mark III B(6500 db type,no oxygen sensor). Water samples were collected from 1.7 liter Niskin bottles mounted on the General Oceanics Rosette multisampler. However, surface water samples were collected by a bucket.

1.3 List of Principal Investigators

The principal investigators for all the parameters measured on the cruise are listed in Table 1.

Table 1: Principal Investigators for All Measurements

Name	Responsibility	Affiliation
Kouji KADONO	Oxygen, Nutrients	KMO
Noriya YOSHIOKA	CTD, S	KMO

1.4 List of Cruise Participants

The cruise participants for leg 1 are listed in Table 2.

Table 2: Cruise Participants for leg 1

Name	Responsibility	Affiliation
Noriya YOSHIOKA	Chief Scientist	KMO
Kouji KADONO	Oxygen, Nutrients	KMO
Tadayoshi UTUNOMIYA	CTD Hardware	KMO
Akira NAKADATE	Oxygen, Nutrients	KMO
Satoshi SUGIMOTO	CTD Software	KMO
Syuji TUBAKI	Oxygen, Nutrients	KMO
Keiichi SATO	Watch Stander	KMO
Hayato WAKIMOTO	Watch Stander	KMO
Hiroki SUZUKI	Watch Stander	KMO
Kiyoshi MURAKAMI	Watch Stander	KMO

2 Measurement Techniques and Calibrations

2.1 CTD

The CTD is EG&G NBIS Mark III B(6500 db type, no oxygen sensor).
A HP 9000 Series 300 model 330(Hewlett Packard) with a 4 MByte of memory was used as the primary data collection device.

The temperature and pressure sensor were calibrated at the calibration facility of S¥E¥A CO., LTD before the cruise. The results are shown in Table 3.
Temprature and pressure(increasing) calibration values are used to correct CTD data, by linear interpolatin inside the the calibrated regime. CTD data outside of the regime is corrected by the calibration values on the boundary, at the each side.

Notice that the upcast pressure data is corrected by Pressure(increasing), not Pressure(decreasing) in Table 3.

Table 3: The temperature and pressure sensor calibration values

Temperature(Caliblated on December 15, pre-creise)

Standard Temperature	CTD Temperature	Difference
0.0409	0.0379	0.0030
1.0037	1.0001	0.0036
2.0041	2.0002	0.0039
3.0045	3.0004	0.0041
4.0044	4.0001	0.0043
5.0046	5.0003	0.0044
6.0050	6.0005	0.0045
7.0045	6.9998	0.0047
8.0052	8.0003	0.0049
9.0050	8.9998	0.0052
10.0050	9.9999	0.0051
11.0050	11.0001	0.0049
12.0053	12.0006	0.0047
15.0512	15.0471	0.0042
17.5359	17.5320	0.0039
20.0594	20.0562	0.0031
25.0204	25.0181	0.0022
29.9502	29.9493	0.0009

Pressure(increasing, Caliblated on December 28, pre-cruise)

Standard Pressure	CTD Pressure	Difference
0.0	1.6	-1.6
98.0	98.0	0.0
293.9	293.4	0.5
489.9	489.2	0.6
979.7	980.3	-0.6
1959.4	1960.5	-1.1
2939.1	2937.7	1.4
3918.8	3915.7	3.1
4898.5	4895.6	2.9
5878.2	5878.3	-0.1

Pressure(decreasing, calibiated on December 28, pre-cruise)

Standard Pressure	CTD Pressure	Difference
0.0	0.4	-0.4
98.0	100.8	-2.8
293.9	298.0	-4.1
489.9	495.2	-5.4
979.7	986.4	-6.7

1959.4	1963.3	-3.9
2939.1	2938.7	0.4
3918.8	3915.6	3.2
4898.5	4895.4	3.1
5878.2	5878.3	-0.1

The conductivity sensor were calibrated at sea using data from the analyses of salinity collected at 4 stations. The salinometer is AUTOSAL 8400B(Guildline) for the analyses of salinity of the water samples.The results are shown in Table 4.
The calibration constant is determined assuming that the bias 0.

Table 4: The conductivity sensor calibration constants

Bias	Slope
0	1.00022

The temperature of "SU9404.SEA" and "SU9404.CTD" files is described with the international temperature scale of 1990, ITS-90.

2.2 Oxygen Measurements

The determination of dissolved oxygen was done by the modified version of the Winkler method described in "Kaiyo Kansoku Shishin (Manual of Oceanographic Observation)" published by the Oceanographical Society of Japan(1970).
No estimation of accuracy and precision and reagent blank has been done.

2.3 Nutrients Analyses

The nutrients analyses were done by the Technicon Auto Analyzer II described in "Kaiyo Kansoku Shishin (Manual of Oceanographic Observation)" published by the Oceanographical Society of Japan(1970). No estimation of accuracy and precision has been done.